AUTHORS: Levadnyy, G.Ye., Brodetskiy, Ye.S.   6-58-5-14/17

TITLE: The Calculation of Standards for Turnover Materials Within the Plan of an Air-Geodetical Undertaking (Raschet normativa oborotnykh sredstv v plane aerogeodezicheskogo predpriyatiya)

PERIODICAL: Geodeziya i Kartografiya, 1958, Nr 5, pp. 66-75 (USSR)

ABSTRACT: Working materials are subdivided into basic- and turnover materials. The basic principles in planning the requirements of an enterprise or firm with respect to turnover materials were laid down by the decree issued by the work- and defense council dated July 23, 1931, which is still in force. In the present case the experience gathered by an air-geodetical enterprise is generalized, and on the basis of data obtained for a number of years, a model-calculation of standards for turnover materials was set up. It is shown that, within the structure of assets to be standardized, stock of low value and objects subjected to a high degree of wear occupy the most important place (more than half of all assets). Basic- and auxiliary material range second. The second characteristic feature of the existing structure is the fact that all assets to be standardized are investments made in the turnover-production fund.

Card 1/2

The Calculation of Standards for Turnover Materials
Within the Plan of an Air-Geodetical Undertaking   6-58-5-14/17

Calculation is not based upon the extent to which plans are realized, but upon the volume of production, the structure of production costs as well as upon other indices connected herewith. The problem of the required level for individual types of stocks according to their importance for production and according to the specific weight within the structure of assets to be standardized are dealt with in detail. On the basis of these analytical data a workable method of calculating standards for the materials turned over within the plan of an air-geodetical enterprise is employed. There are 8 tables

1. Geophysical surveying—Materials   2. Materials—Standards
3. Mathematics

Card 2/2

3(4)   SOV/6-59-4-13/2o
AUTHORS: Levadnyy, G. Ye., Brodetskiy, Ye. S.

TITLE: Organization of the Economic Book-keeping in an Aerogeodetic
              Enterprise (Organizatsiya khozyaystvennogo rascheta v aero-
              geodezicheskom predpriyatii)

PERIODICAL: Geodeziya i kartografiya, 1959, Nr 4, pp 40-49 (USSR)

ABSTRACT: The editors invite the heads of aerogeodetic enterprises,
              heads of field squads, and other readers to take part in the
              discussion of the problems put forward here. An attempt is
              made here to generalize the practice of economic book-keeping.
              The first chapter investigates the basic conditions for econo-
              mic book-keeping in aerogeodetic services. The introduction
              of regular book-keeping within the individual departments
              of the enterprise : the squads, shops, brigades and groups,
              is considered most important. The form of book-keeping in
              the individual departments within an enterprise greatly dif-
              fers from the book-keeping of the enterprise itself. The
              basis for each such subsection of the enterprise is the cor-
              responding plan. These plans should provide for book-keeping
              indices. Their characteristics should be considered in intro-
Card 1/2   ducing the book-keeping in the auxiliary services. It is point-

SOV/6-59-4-13/20

Organization of the Economic Book-keeping in an Aerogeodetic Enterprise

ed out in detail what should be considered in determining
the indicas for transportation by car, for transportation by
horse carriages and for the supply of timber. The second
chapter investigates the relationship between the individual
subsections of the enterprise with respect to economic book-
keeping. The third chapter explains the principle of material
interest. The leading personnel should be paid according to
the time-premium-wage system. The premium should depend, how-
ever, on the amount of saving. The premiums should be paid
from the means of the premium fund of the corresponding de-
partment, not from the means of the fund of the enterprise.
The fourth chapter deals with evidence and accounting. It is
pointed out that up to date no instructions for the planning,
evidence, and calculation of cost of production are available
for the aerogeodetic services. The fifth chapter concerns
financing. Two examples are given: a calculation of financing
for a squad for one year, and a calculation for one month.
There are 3 tables.

Card 2/2

3(4)

AUTHORS: Sirenko, I. F., Brodetskiy, Ye. S.   SOV/6-59-8-17/27

TITLE: Competition for the Title of Brigades of Communist Work at the
              Ukrainian Aerogeodetic Enterprise (Sorevnovaniye za zvaniye brigad
              kommunisticheskogo truda v Ukrainskom aerogeodeticheskom
              predpriyatii)

PERIODICAL: Geodeziya i kartografiya, 1959, Nr 8, pp 64-65 (USSR)

ABSTRACT: Several months have passed since the competition first started
              at the above enterprise. A public meeting of Komsomol members
              was held on June 4. The young people of the enterprise attended
              the meeting in order to hear what the situation of the
              competition was. The following persons took the floor:
              Ira Shishova, Secretary of the Komsomol Organization, opened
              the meeting. The next speaker was Engineer Nelli Rytsk (other
              members of the brigade are Sinitskaya, Nikolayeva, Spareva,
              Protasevich), followed by Galya Zozulya, in whose brigade there
              is also Ludmila Kucheruk (the brigade cooperates closely with
              the brigade of Mayya Karpyuk), and Tanya Kissa, in whose brigade
Card 1/2   are Nadya Polozova, Tamara Tikhonova, Ira Logvinenko,

Competition for the Title of Brigades of Communist   SOV/6-59-8-17/27
Work at the Ukraina Aerogeodetic Enterprise

> Lyuda Stepanenko, Raya Kotel'nikova. Another speaker was
> Nina Boykova, a worker from the candy factory imeni Karla
> Marksa (imeni Karl Marx), who discussed the experiences
> gathered in her brigade. - The meeting agreed to fulfil the
> Seven-Year-Plan in six years.

Card 2/2

BRODFELD, B.

A method of static computation of elastic dam soles rigidly fixed on the contour. p. 79.

HIDROTEHNICA. (Asociatia Stiintifica a Inginerilor si Tehnicienilor din Romina) Bucuresti, Rumania, Vol. 4, no. 3, Mar. 1959.

Monthly list of East European Accessions (EEAI) LC Vol. 8, No. 9, Sept./1959.

Uncl.

BRODFEID, B.

TECHNOLOGY

Periodicals: HIDROTEHNICA. Vol. 3, no. 10, Oct. 1958

BRODFEID, B. Some aspects of computing the foundation rafts of decantation
apparatus. p. 375

Monthly List of East European Accessions (EEAI) LC, Vol. 8, No. 2,
                                        February 1959, Unclass.

BRODI, S., nauchnyy sotrudnik; KOROLYUK, V., kand. fiz.- matem. nauk

Mass servicing as a mathematical problem . Nauka i zhyttia 13
no.10:6-7 N '63.   (MIRA 16:12)

1. Institut matematiki AN UkrSSR (for Brodi).

SOV/21-59-6-2/27

AUTHOR: Brodi, S. M.

TITLE: On an Integral-Differential Equation for Systems
                 with τ-Waiting

PERIODICAL: Dopovidi Akademii Nauk Ukrains'koi RSR, 1959, Nr 6,
                 pp 571 - 573 (USSR)

ABSTRACT: The author examines the simplest flow of demands on the
                 service of one device. The time of service is a random
                 value of exponential distribution. The demand entering the
                 system is served immediately if the device is not engaged,
                 and has to wait in line if the device is engaged. The demand
                 waits for service no longer than the time τ, after which it
                 is lost. Integro-differential equations for the time of
                 waiting for service are formulated by the author. The
                 system with waiting is a system where the demand waits
                 only a limited time, and can be served only when the device
                 is free, or will be free within a time less than τ = const
                 $(\tau > 0)$. Designations used in the calculations are
Card 1/2   standard mathematical.

SOV/21-59-6-2/27

On an Integral-Differential Equation for Systems with τ-Waiting

There are 3 references, 1 of which is American,
1 Hungarian and 1 Soviet

ASSOCIATION: Institut matematiki AN UkrSSR (Institute of Mathematics of
the AS UkrSSR)

PRESENTED: By B. V. Gnedenko, Member, AS UkrSSR

SUBMITTED: December 25, 1958

Card 2/2

BRODI, S. M.

PHASE I BOOK EXPLOITATION   507/3981

Sreshchaniye po teorii veroyatnostey i matematicheskoy statistike, Yerevan, 1958

Trudy Vsesoyuznogo soveshchaniya po teorii veroyatnostey i matematicheskoy statistike, Yerevan, 19-25 sentyabrya 1958 g. (All-Union Conference on the Theory of Probability and Mathematical Statistics. Held in Yerevan 19-25 September, 1958. Transactions) Yerevan, Izd-vo AN ASSR, 1960. 291 p. Errata slip inserted. 2,500 copies printed.

Sponsoring Agency: Akademiya nauk Armyanskoy SSR.

Editorial Staff: G.A. Arbartsumyan, B.V. Gnedenko, Ye.B. Dynkin, Yu.V. Linnik and S. N. Tumanyan; Ed. of Publishing House: A.G. Sikmi; Tech. Ed.: M.A. Kaplagyan.

PURPOSE: The book is intended for mathematicians.

COVERAGE: The book contains 41 articles submitted to the Conference and dealing with the theory of probability and mathematical statistics. Some of the articles are the papers read at the Conference and edited for publication, while others outline the theses of papers which appeared or are scheduled to appear, wholly or in part, in other publications; in some cases, such publications are quoted. A list of the papers whose contents were published elsewhere is included and the places of publication are indicated. Individual articles examine theories of mass service, spectral instruments, numbers, games, and certain functions, and discuss the theorems of Shannon, Markov's chains, and certain processes, (quantities, and functions. Such items is the method of least squares, the stochastic Markov's and disturbance, measures and their application, a scheme of Bernoulli experiments, Markov-type realm fields, visible distribution of stars, Brownian motion, capacity of radio channels, and defective products are considered. No personalities are mentioned. References accompany some of the articles.

Bilpov, B.V. Asymptotic Cardinality of Some Nonparametric Criteria Concerning Displacement. (Theses)   98

Sarmanov, O.V. On Maximum Coefficient of Correlation. (Theses)   121

Sleger, A.A. New Results Concerning Independent Statistics. (Theses)   103

Shelgovskiy, O.V. On the Theory of the Method of Least Squares When Weights are Unknown   106

Arbartsumyan, G.A. On Quantity of Information About an Unknown Probability in the Scheme of Bernoulli's Experiments   112

Tumanyan, S.D. On the Statistical Criterion, x^2, as Applied to the Problem of Two Samples   121

Arbartsumyan, V.A. On Fluctuations in the Visible Distribution of Stars   129

Brodi, S.M. On One Problem in the Theory of Mass Service   135

Kovalenko, I.M. On the Restoration of Additive Type of Distribution by the Sequence of Series of Independent Observations   118

Kiou, D.M. Random Quantities of Micропакет Semigroups. (Theses)   160

Dobrushin, R.L., Yu.V. Linnik, and R.V. Uchterinte. Some New Results in the Probabilistic Theory of Numbers, and Simulation of Brownian Motion. (Theses) 162

Dobrushin, R.L., Yai. Dungin, and B.S. Tsybakov. Approximate Computation of the Carrying Capacity of Radio Channels with Random Parameters 168

Kordonskiy, D.B. Distribution of the Number, X, of Defective Products in Lots   172

Khalfin, L.A. On Theoretical Informational Approach to the Theory of Spectral Instruments   187

Romanovskiy, I.B. On Probability Problems Leading to Dynamic Programming   204

Card 6/8

/6.6/0 ⊃

30851
S/044/61/000/008/028/039
C111/C333

AUTHOR: Brodi, S. M.

TITLE: On a problem of the theory of queuing

PERIODICAL: Referativnyy zhurnal, Matematika, no. 8, 1961, 26
             abstract 8V179.("Tr. Vses. soveshchaniya po teorii
             veroyatnostey i matem. statistiki", 1958, Yerevan, AN
             Arm SSR, 1960, 143-147)

TEXT: Assume that a stationary Poisson input flow with the
parameter $\alpha > 0$ is given. The service time is distributed according to
an exponential law with the parameter $\beta > 0$. The waiting time
$\xi^{(\tau)}(t)$ of a visitor ariving at the moment t is bounded by the constant
$\tau > 0$. Let

$$F^{(\tau)}(t,x) \equiv P\left\{\xi^{(\tau)}(t) \le x \mid \xi^{(\tau)}(t) < \tau\right\}$$

Then $F^{(\tau)}(t,x)$ satisfies the equation

$$\frac{\partial F^{(\tau)}(t,x)}{\partial t} = \frac{\partial F^{(\tau)}(t,x)}{\partial x} -$$

Card 1/3

On a problem of the theory of . . .

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S/044/61/000/008/028/039
C111/C333

$$-\alpha \left[F^{(\tau)}(t,x) - \int_0^x (1 - e^{-\beta(x-y)}) \, dF^{(\tau)}(t,y) \right]$$

If $\alpha/\beta < 1$, then we have

$$\frac{dF_\tau^*(x)}{dX} = \alpha \left\{ F_\tau^*(x) - \int_0^x \left[1 - e^{-\beta(x-y)} \right] dF_\tau^*(y) \right\}$$

for $F_\tau^*(x) \equiv \lim_{t \to \infty} F^{(\tau)}(t,x)$. Let

$$\tilde{F}_\tau(p) = \int_0^\infty e^{-px} dF_\tau^*(x) \qquad (\text{Re}(p) > 0).$$

Then it holds

Card 2/3

On a problem of the theory of . . .

$$\tilde{F}_\tau(P) = \left[F_\tau(0) - e^{-\beta\tau}(1 - F(\tau)) \right] \Bigg/ \left[1 - \frac{\alpha(P + \beta e^{-\tau(P+\beta)}}{P(P+\beta)} \right].$$

Note of the reviewer: The problem is considered without the restriction $\xi^{(\tau)}(t) < \tau$ in another paper of the author (Dokl. AN Ukr SSR, 1959, 6 , 571-573).

[Abstracter's note: Complete translation.]

Card 3/3

44206

S/021/62/000/011/002/013
D251/D308

16.6100

AUTHOR: Brodi, S. M.

TITLE: Unilinear system with τ-waiting in the case of an Erlang incoming stream

PERIODICAL: Akademiya nauk Ukrayins'koyi RSR. Dopovidi, no. 11, 1962, 1425-1428

TEXT: A system of service in which a client must wait for a finite time $\tau > 0$ is called a system with τ-waiting. The author considers the problem where clients arrive at times $\{t_i\}$ ($i = 1, 2,$ ...) such that the values of $t_i - t_{i-1}$ form an Erlang distribution and the service times $\{y_i\}$ ($i = 1, 2,$ ...) of the respective clients are independent and equally distributed random quantities. The simplified case $G_k(x) = [G_0(x)]^k$ is considered, where $P\{t_i - t_{i-1} \leqslant x\} = G_k(x)$ and by considering the random process $\eta_\tau(t)$ -

Card 1/4

Unilinear system with ...   S/021/62/000/011/002/013
                                          D251/D308

the waiting time of a client joining the system at a time t, and

writing $P\left\{\eta_t(t) \leqslant x\right\} = F(t, x) = \sum_{j=1}^{k} F_j(t, x)$, a system of differ-

ential equations is obtained which must be satisfied by $F_j^*(x) =$

$= \lim_{t \to \infty} F_j(t, x)$ in the steady case. By applying the Laplace-Stielt-

jes transform and the methods of matrix theory, the steady distri-
bution of an arbitrary demand is found to be

$$\bar{F}^*(x) = e^{B(x-\tau)}\bar{F}^*(\tau) + \int_{\tau}^{x} e^{B(x-y)}\bar{\varphi}(y)dy \quad x > \tau$$

Card 2/4

Unilinear system with ...

$$B = \begin{pmatrix} \lambda & 0 & 0 & \ldots & -\lambda \\ 0 & -\lambda & \lambda & \ldots & 0 \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ \cdot & & & & \\ 0 & \ldots & & -\lambda & \lambda \end{pmatrix}, \quad \bar{\varphi}(x) = \begin{pmatrix} \varphi(x) \\ 0 \\ \cdot \\ \cdot \\ \cdot \\ 0 \end{pmatrix}, \quad \bar{F}^* = \begin{vmatrix} F_1^*(x) \\ F_2^*(x) \\ \cdot \\ \cdot \\ \cdot \\ F_k^*(x) \end{vmatrix}$$

where

$$\varphi(x, \Pi(x)) = \int_0^{\tau} [1 - H(x - y)] \, dF_k^*(y)$$

$$\Pi(z) = \sum_{i=1}^{k} z^i F_i^*(0)$$

Card 3/4

Unilinear system with ...

$P\{y_i \leqslant x\}$ = H(x) is the distribution function of the service times
and λ is the expectation occurring in the formula for $G_k(x)$.

ASSOCIATION: Instytut matematyky AN URSR (Institute of Mathematics
of the AS UkrSSR)

PRESENTED: by B. V. Hnyedenko, Academician

SUBMITTED: March 2, 1962

Card 4/4

BRODI, S.M. (Kiyev)

Limit theorem in the queueing theory. Ukr. mat. zhur. 15 no.1:
76-79 '63.   (MIRA 16:3)
(Queueing theory)
(Limit theorems (Probability theory))

BRODICH, N. V.

Handbook for railroad make-up men and yard couplers. Izd. 2., ispr. i dop. Moskva, Gos. transp. zhel-dor. izd-vo, 1954. (Mic 55-3587) Collation of the original, as determined from the film: 354 p.

Microfilm Slavic 387 AC

1. Welding.   2. Railroads - Cars - Maintenance and repair

CZECHOSLOVAKIA / UNITED STATES

HYNIE, S.; KRISHNA, G.; BRODIE, B.B.; Pharmacological Institute,
Medical Faculty, Charles University (Farmakolosicky Ustav Fak.
Vseob. Lek. KU), Prague; Lab. Chem. Pharmacol. National Heart
Institute, NIH, Bethesda, Md.

"Mechanism of the Antilipolytic Effect of Betalytic DCI and
Alphalytic Phentolamine."

Abstract: The degree of lipolysis is a function of the content of
the cyclic 3',5'-adenosine monophosphate in the fatty tissue.
The antilipolytic effect of DCI and of Phentolamine was tested
in vitro on rat fatty tissue. DCI in low concentrations blocks
only   noradrenalin lipolysis; phentolamine in low concentrations
did not have an antilipolytic effect. At high concentrations
(10^{-3}M) both drugs inhibit the activity of lipase. 3 Western ref-
erences. Submitted at 14 Days of Pharmacology at Smolenice, 16
Feb 66.

1/1

CZECHOSLOVAKIA

DLABAC, A.; COSTA, E.; BRODIE, B. B.; Research Institute of Pharmacy and Biochemistry (Vyzkumny Ustav pro Farmacii a Biochemii), Prague.

"Relationship Between the Central Effects of Reserpine and the Rate of Release of 5-Hydroxytryptamine."

Abstract: The correlation between the effect of reserpine and the decrease in the amount of 5-hydroxytryptamine (5-HT) in the homogenate of rat brain was investigated. Intravenous application of reserpine causes a fast exponential rate of decrease in the 5-HT content of the brain. The intensity of the central effect is proportional to the rate of initial reduction of 5-HT. A higher dose increases the intensity and the duration of the effects. Maximum rate of reduction in 5-HT was found after an administration of 5 and 10 mg/kg of reserpine. No references. Submitted at 14 Days of Pharmacology at Smolenice, 17 Feb 66.

1/1

BRODIN, B. V., Cand Geol-Mineral Sci -- (diss) "Comparative Characteristics of the Material Composition of Ore Deposits in the Kurgan Plexus of Talas Abatau." Mos, 1958. 16 pp, (Min Higher Ed USSR, Mos Inst of Non-ferrous Metals and Gold im M. I. Kalinin, Chair of Mineralogy and Petrography), 110 copies. (KL, 7-58, 109)

- 9 -

BRODIN, B.V.

Endogenetic goethite in the Ken-Shanyk ore deposit. Zap. Vses.
min. ob-va 87 no.4:496-498 '58.   (MIRA 12:1)
                    (Talas Ala-Tau—Goethite)

BRODIN, B.V.

Mineralogy of tin in ores of the Kurgan deposit. Zap. Kir. otd.
Vses. min. ob-va no.1:57-65 '59.   (MIRA 14:3)
            (Talas Ala-Tau—Tin)

BRODIN, B.V.

Mineral composition of ores in the Kurgan deposit (Talas Ala-Tau),
their formation and distribution. Geol. rud. mestorozh. no.5:57-73
S-O '59.   (MIRA 13:2)

1.Institut tsvetnykh metallov im. M.I. Kalinina, Moskva.
                (Talas Ala-Tau--Ore deposits)

BRODIN, B.V.

Tin minerals and their paragenesis in ore deposits of the
Kurgan group in the Talas Ala-Tau. Zap.Vses.min.ob-va 88
no.2:144-151 '59.   (MIRA 12:8)
                    (Talas Ala-Tau--Tin)

BRODIN, B.V.

Myremekite intergrowth of galena with chalcocite. Zap. Vses.
min. ob-va 89 no.4:415-423 '60.   (MIRA 13:11)
    (Myrmekites)   (Galena)   (Chalcocite)

BRODIN, B.V.

> Wurtzite from the Ken-Shanyk deposit. Trudy Min. muz. no.11:
> 157-170 '61.   (MIRA 16:7)
>
>   (Talas Ala-Tau—Wurtzite)

DYMKOV, Yu.M.; BRODIN, B.V.

Reddening of minerals in uranium-bearing veins. Atom. energ. 10
no.1:35-42 Ja '61.   (MIRA 13:12)
                (Uraninite)   (Hematite)

BRODIN, B.V.; DYMKOV, Yu.M.

Montroseite from hydrothermal veins of the Pribram deposit. Zap.-
Vses.min.ob-va 90 no.6:653-659 '61.   (MIRA 15:2)
                    (Pribram region--Montroseite)

BRODIN, B.V.

Internal structure and interrelations of nodular segregations
of some sulfides. Zap.Vses.min.ob-va 91 no.5:589-595 '62.

(MIRA 15:11)

(Sulfides)

BRODIN, B.V.

Role of diffusion in the replacement of minerals and the decomposition of solid solutions. Trudy Min. muz. no.14: 79-95 '63.   (MIRA 16:10)

(Mineralogical chemistry)   (Solutions, Solid)

BRODIN, B.V.; DYMKOV, Yu.M.

Hard bitumens in uranium-bearing veins. Atom.energ. 16
no. 5:432-437 My '64. (MIRA 17:5)

BRODIN, I.S.

Automatic unit for testing gas meters with a rated discharge up to 1.000 cubic meter per hour. Izm.tekh. no.5:53-57 My '62.

(MIRA 15:6)

(Gas meters--Testing)

BRODIN, I.S.

Gas rotational meters of the Ivano-Frankovsk Instrument Plant.
Gaz. prom. 9 no.2:19-20 '64.   (MIRA 17:12)

L 9629-66   EWT(1)/EWA(h)/ETC(m)   WW

ACC NR: AP6000038

SOURCE CODE: UR/0115/65/000/010/0061/0062

AUTHOR: Brailov, E. S.; Brodin, I. S.; Sitnitskiy, Yu. I.; Chuchman, T. S.

ORG: None

TITLE: Improving the accuracy of a gas rotation meter

SOURCE: Izmeritel'naya tekhnika, no. 10, 1965, 61-62

TOPIC TAGS: gas flow, flow meter, measuring instrument, error

ABSTRACT: One of the main disadvantages of gas rotation meters, especially in research
applications, is the considerable error ($\pm$ 2%) of industrially manufactured devices. The
authors present the results of a study which is directed toward the improvement of the
accuracy of such meters. The main cause of error is the overflow of gas through gaps
between the moving rotors and the walls of the housing, depending on the pressure drop at
the meter. The latter, in turn, depends on the flow rate. Hence, a mode of operation in
which the pressure drop at the meter equals zero should eliminate or substantially reduce
the error. In order to achieve this the rotors should be powered not by the energy obtained
from the gas being measured, but from an external source. With this purpose, the authors
designed and tested an automatic system which maintains zero pressure drop in a gas
rotation meter (Fig. 1). Tests show that, in spite of large inertia of the rotors of a (RS-400)
gas meter, the transfer process in the system does not exceed 30 sec. The work was per-

Card 1/2   UDC 681.122

L 9629-66

ACC NR: AP6000038

formed by L'vov Polytechnic Institute (L'vovskiy politekhnicheskiy institut) on orders from Ivano-Frankovskiy Instrument Building Plant (Ivano-Franskovskiy priborostroitel'nyy zavod). Orig. art. has: 2 figures.

(FD - ferrodynamic sensor; M - master; EA - electronic amplifier; RM - reversing motor; S - selsyn; MA - magnetic amplifier; AL - armature loop of d-c motor; DYA - dynamoelectric amplifier)
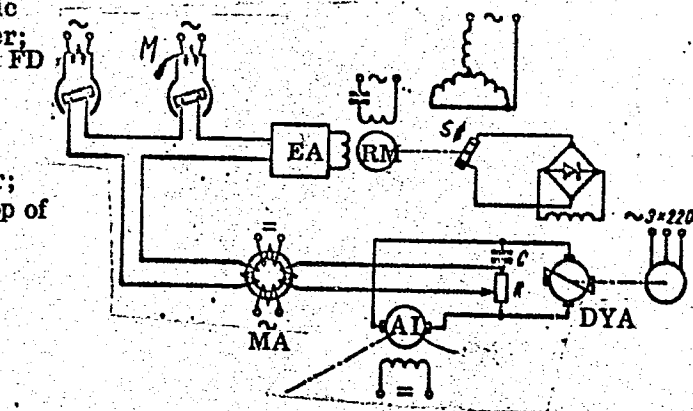

Fig. 1 - Automatic system for maintaining zero pressure drop.

SUB CODE: 14 / SUBM DATE: none

Card   2/2

BRODIN, M.S.

Absorption and dispersion of light in stilbene crystals at room temperature and below. M. S. Brodin. Optika i Spektroskopiya 1, 878-80(1958).—The absorption character- istics of cryst. plates (0.2-0.3 μ thick) of stilbene formed by sublimation onto quartz plates with optically parallel walls were investigated with an interferometer by a photographic method with polarized light. The absorption curves showed a shift in the absorption bands by ∼100 cm⁻¹ in the direction of the long-wave region as the temp. of the crystal was gradually lowered from room temp. to 80° K. For the weak components the force of the oscillator (f) calcd. from the equation (given below) was found to be 0.13: $f = \omega_0 m / \pi^2 N e^2 \int \chi(\omega) d\omega$ (where ω = cyclic frequency corresponding to the max. in the absorption; m and e = electron mass and charge; N = no. of mols. per unit vol.). It remained practically const. throughout the entire range of temps. The dispersion curves in the region of trans- parency had a sharp increase in slope at the temp. of liquid N. The max. on the absorption curve and on the dispersion curve corresponded, resp., to each other. On the basis of the distribution of intensities in the two spectroscopic components and of the orientation of mols. in the lattice, the direction of the dipole moments transitions were approxi- mated:

transition	polarization	γ (cm⁻¹)	f_b
I {	N_g	29800	0.13
	N_g	29900	0.64
II {	N_p	40000	1.1
	N_g	40700	0.3

(Here, the N_g, N_p = polarization along the axis of the great- est and the smallest n, resp.; f_b = force of the oscillator for the k transition.) The first transition was polarized in the direction of the middle axis, the second in a direction close to the axis of CH=CH of the mol.—A. P. Kotsko.

Inst. Physics, AS UkrSSR

BRODIN, M.S.

Dichroism of some polycyclic crystals. Ukr. fiz. zhur. 1 no.4:
376-381 Q-D '56.

(MIRA 10:2)

1. Institut fiziki AN URSR.
(Stilbene--Optical properties)
(Dichroism)

BRODIN, M.S.; MEDVEDEV, V.S.; PRIKHOT'KO, A.F.

Cryostats used in Jamin interferometry at liquid hydrogen tempera-
tures. Prib.i tekh.eksp.no.3:96-98 M-D '56.   (MLRA 10:2)

1. Institut fiziki AN USSR.
    (Interferometry)   (Cryostat)

the data of the curves of the end of the
dispersion curves the oscillator strengths of the 1st and 2nd
electron transition of the I crystal are estd., and also the ones
for the first transition of II. According to these results the
crystals of I and II absorb strongly and are electron
for the 1st electron transition in I the strongest of the
latter if polarization along the Y. component is approx.
times as great as that of mon along the X.Z. component and for II
this factor is 6.4

MT

BRODIN, M. S. Cand Phys-Math Sci -- (diss) "Study of the absorption and dispersion of light in crystals of certain polycyclic ~~compounds~~ compounds." Kiev, 1957. 7 pp 20 cm. (Acad Sci UkSSR. Inst of Physics), 100 copies. (KL, 13-57, 97)

-4-

PRIKHOT'KO, A. F.

24(7)   p.3   PHASE I BOOK EXPLOITATION   SOV/1365

L'vov. Universytet

Materialy X Vsesoyuznogo soveshchaniya po spektroskopii. t. 1:
Molekulyarnaya spektroskopiya (Papers of the 10th All-Union
Conference on Spectroscopy. Vol. 1: Molecular Spectroscopy)
[L'vov] Izd-vo L'vovskogo univ-ta, 1957. 499 p. 4,000 copies
printed. (Series: Its: Fizychnyy zbirnyk, vyp. 3/8/)

Additional Sponsoring Agency: Akademiya nauk SSSR. Komissiya po
spektroskopii. Ed.: Jazer, S.L.; Tech. Ed.: Saranyuk, T.V.;
Editorial Board: Landsberg, G.S., Academician (Resp. Ed., Deceased),
Neporent, B.S., Doctor of Physical and Mathematical Sciences,
Fabelinskiy, I.L., Doctor of Physical and Mathematical Sciences,
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Candidate of Physical and Mathematical Sciences, Klimovskiy, L.K.,
Candidate of Physical and Mathematical Sciences, Miliyanchuk, V.S.,
Candidate of Physical and Mathematical Sciences, and Glauberman,
A. Ye., Candidate of Physical and Mathematical Sciences.

Card 1/30

Brodin, M.S., and A.P. Prikhot'ko. Absorption and
Dispersion of Light in Certain Molecular Crystals

Prikhot'ko, A.P., and M.T. Shpak. Polarization of   16
Absorption Bands of Impurities in Crystals

Card 3/30   21

Inst. Physics, AN URSR

AUTHORS: Brodin, M.S. and Prikhot'ko, A.F.
TITLE: Dispersion and absorption of light in anthracene crystals   51-4-7/25
at 20.4°K. (Dispersiya i pogloshcheniye sveta v kristallakh
antratsena pri 20.4°K).

PERIODICAL: "Optika i Spektroskopiya" (Optics and Spectroscopy)
1957, Vol.2, No.4, pp.448-453 (U.S.S.R.)

ABSTRACT: Colourless anthracene crystals strongly absorb in the
near ultraviolet at 24500-29000 cm⁻¹ (first electron-
vibration transition in the crystal) and also at
37000-42500 cm⁻¹ (second transition). This paper reports
on the refractive index dispersion and the absorption co-
efficients of anthracene crystals at 20.4°K at 25000-37000
cm⁻¹ for two directions of the light vector: parallel and
perpendicular to the monoclinic crystal axis. To study the
dispersion a small Jamin interferometer was crossed by a
spectrograph. The method is due to I.V.Obreimov (Jubilee
collection of papers on the 70th birthday of Acad. A.F.Ioffe,
p.523, 1950 - in Russian). Spectrograms were obtained with
and without a crystal in the light beam. The absorption was
measured with the cooperation of S.Z.Shul'ga (see also
Zavodskoya laboratoriya, current number in print). A photo-
multiplier FEY-18 was used. For the dispersion and absorp-
tion measurements a quartz spectrograph of medium dispersion

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Dispersion and absorption of light in anthracene crystals   51-4-7/25
at 20.4°K. (Cont.)

was used. Low-pressure hydrogen lamps were used as light
sources. Glan-Thompson prisms were used as polarizers. The
iron arc spectrum was used as wavelength standard. The
accuracy of measurement of the refractive index was about
2% and of the absorption coefficient 8-10%. The results
are given in four graphs. The refractive index at $20.4°K$
oscillates strongly (from 1 to 6) at $25000-28000$ cm^{-1}; its
value outside this region is 1.5-2. The absorption coeffici-
ents (values up to 0.60) are shown for both $293°K$ and $20.4°K$;
oscillations here occur at $25\,000 - 29\,000$ cm^{-1}. From the
absorption coefficients and the refractive index the reflec-
tivity curves (values up to 0.50) are constructed; again
oscillations occur at $25\,000 - 29\,000$ cm^{-1}. In all graphs the
largest maxima occur at about $25\,000$ cm^{-1}. The oscillator
strengths of electron-vibration transitions were calculated
to be for the three directions:(a) parallel to the monoclinic
axis, (b) perpendicular to that axis and (c) at right angles

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Dispersion and absorption of light in anthracene crystals   51-4-7/25
at 20.4°K. (Cont.)

to (a) and (b). Their values were found to be: (a) 0.12,
(b) 0.05 and (c) 0.13. There are six figures (including one
half-tone plate), and nine references, seven of which are
Slavic.

ASSOCIATION: Institute of Physics, Academy of Sciences of the
Ukrainian S.S.R., Kiev. (Institut Fiziki AN USSR, Kiev).
SUBMITTED: August 18, 1956.
AVAILABLE: Library of Congress

Card 3/3

BRODIN, M.S.; PRIKHOT'KO, A.F.

Absorption and scattering of light by various molecular crystals.
Fiz. sbor. no.3:16-21 '57.

(MIRA 11:8)

1. Institut fiziki AN USSR.

(Anthracene—Spectra)

BRODIN, M.S.; PRIKHOT'KO, A.F. [Prykhot'ko, A.F.]

Absorption and dispersion of light in certain crystals of the
polycyclic series [In Ukrainian with summary in English]. Ukr.
fiz. zhur. 3 no.1:79-87   Ja-F '58.

(MIRA 11:4)

1.Institut fiziki URSR.

(Stilbene--Optical properties)
(Acetylene--Optical)

AUTHORS: Brodin, M.S., Pakhomova, O.S. and Prikhot'ko, A.F.   SOV/51-5-2-4/26

TITLE: Absorption of Light by Stilbene Crystals at 20°K (Pogloshcheniye sveta kristallami stil'bena pri 20°K)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol 5, Nr 2, pp 123-127 (USSR)

ABSTRACT: The authors obtained and analysed the absorption spectrum of crystalline stilbene at 20°K. The crystals were prepared by sublimation and were attached to quartz glass plates. The spectra were photographed in polarized light using an ISP-22 quartz spectrograph. A hydrogen lamp with a "uviol" window or a krypton lamp GSVD-120 were used as light sources. Iron spectrum was used for calibration. A FEU-18 photomultiplier was used as the receiver. Photographs of the two polarized components of the absorption spectrum (at 20°K) of a stilbene monocrystal, 0.2 μ thick, are shown in Fig 1. Fig 2 gives the absorption curve of a stilbene crystal at 20.4°K for vibrations parallel to the N_p axis. Fig 3 gives the absorption spectra of a stilbene crystal (curve 1) and a solid solution of stilbene in tolane (curve 2) at 20°K (vibrations parallel to the N_g axis). The authors make the following deductions from Fig 3. (1) The intensity of the first (purely electronic) band, as compared with the other bands, is considerably great...

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Absorption of Light by Stilbene Crystals at 20°K

crystal spectrum than the intensity of the corresponding band in the solid solution spectrum. (2) 770 cm^{-1} vibration frequency is present in the pure crystal spectrum. The same vibration has a frequency of 745 cm^{-1} in the solid solution of stilbene in dibenzyl but it is absent in the solid solution of stilbene in tolane. (3) The bands corresponding to the harmonics of the 1590 cm^{-1} vibrations are stronger than the fundamental bands in the N_g-component of the pure crystal spectrum, but they are weaker in the solid solution spectra. The authors used crystals in optical contact with quartz plates or layers produced by melting between two quartz plates. In both cases cooling to the liquid-hydrogen temperature produced considerable mechanical strain due to the difference between the thermal expansion coefficients of quartz and stilbene. Such strains affect polarization of separate bands and their spectral position. The vibrational structure, however, is practically unaffected but the purely electronic bands are altered considerably and this has to be allowed for in making of any deductions.

Card 2/2   There are 3 figures and 5 Soviet references.

ASSOCIATION: Institut fiziki, AN UkrSSR, g. Kiyev (Institute of Physics, Academy of Sciences of the Ukrainian S.S.R., Kiyev) 1. Stilbene crystals--Preparation

SUBMITTED: September 14, 1957   2. Single crystals--Spectrographic analysis

BRODIN, M.S.;PAKHOMOVA, O.S.;PRIKHOT'KO, A.F.

Absorption of light by stilbene crystals at 20°K. Opt. i spektr. 5
no. 2:123-127 Ag '58.   (MIRA 11:10)

1. Institut fiziki AN YSSR, g. Kiyev.
                    (Stilbene)
                (Absorption of light)
            (Low temperature research)

24(2), 24(7)

AUTHORS: Brodin, M. S., Soskin, M. S.   SOV/48-22-11-8/33

TITLE: Connection of Absorption and Dispersion in Crystals at the
               Example of the 1,2-Benzanthrazen (Svyaz' pogloshcheniya i
               dispersii v kristallakh na primere 1,2-benzantratsena)

ABSTRACT: In this work the absorption and dispersion spectra of a few
               molecular crystals have been examined together and the results
               have been compared to those of the Kramers' formula type. As
               object for an examination the 1,2-benzanthrazen-crystal was
               chosen. It was chosen over other crystals because it has two
               main-axes of the indicatrix of the indices of refraction in the
               plane of the lamellae produced in sublimation. For the compar-
               ison of the curves of dispersion and absorption the general
               integrals were used. They were found using Kramers' phenomenolog-
               ic method. They can also be found on basis of the micro-theory
               (Ref 8). The experimental data which were used for the compari-
               son are represented in figures 1 and 2. By comparing the sizes
Card 1/2   of the turning of these curves, which were determined experi-

Connection of Absorption and Dispersion in Crystals at the Example of the 1,2-Benzanthrazen

SOV/48-22-11-8/33

mentally and calculated, an obvious divergence is shown. It is far beyond the limit of error (the calculated turning of the scale is at least three times smaller than the one determined experimentally). This has been observed on all 1,2-benzanthrazen-crystals examined. This divergence will be smaller for the same spectral-component at a normal temperature, but it will be still of importance. Similar phenomena have been observed earlier with crystals of other substances at low temperatures. There are 2 figures and 8 references, 6 of which are Soviet.

ASSOCIATION: Institut fiziki Akademii nauk USSR (Institute of Physics, AS UkrSSR)

Card 2/2

AUTHORS: Brodin, M.S., Prikhot'ko, A.F. and Soskin, M.S.

TITLE: On Non-Validity of the Kramers--Kronig Dispersion Relationships in the Case of Molecular Crystals at Various Temperatures (O neschlyudenii dispersionnykh sootnosheniy Kramersa--Kroniga v sluchaye molekulyarnykh kristallov pri razlichnykh temperaturakh)

PERIODICAL: Optika i Spektroskopiya, 1959, Vol 6, Nr 1, pp 28-32 (USSR)

ABSTRACT: Kramers--Kronig formulae (Ref 1) give the relationship between refractive indices and the absorption coefficients of a sample. They are derived from Maxwell's electromagnetic equations and should hold wherever Maxwell's theory holds. For some substances the Kramers--Kronig formulae were found to hold at room temperature (Refs 2, 3). The same substances when tested at low temperatures showed a disagreement between theory and experiment. The present paper describes an attempt at verification of these relationships in strongly absorbing molecular crystals of anthracene, 1,2-benzanthracene, stilbene and tolane which were studied at temperatures of 290, 80 and 20°K. The experimental data on absorption and dispersion of light in monocrystals of anthracene, stilbene and tolane were published earlier (Refs 5-7). The present paper gives the results obtained on 1,2-benzanthracene; these results

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On Non-Validity of the Kramers--Kronig Dispersion Relationships in the Case of
Molecular Crystals at Various Temperatures

are shown in Fig 1 (absorption spectrum at 20°K) and Fig 2 (dispersion
curve at 20°K - curve 1 was obtained experimentally and curve 2 was
calculated). To measure the absorption and dispersion, thin samples,
cut from monocrystals, were used. The monocrystals themselves were
produced by sublimation. Measurements were made in polarized light.
The dispersion curves were obtained interferometrically, by means of a
Jamin interferometer. The absorption curves were measured
photometrically using photographic film and photoelectric multipliers.
The results reproduced from Refs 5-7 and those reported on
1,2-benzanthracene show that in some molecular crystals the Kramers--
Kronig dispersion relationships may not be obeyed. The departure from
these relationships is greatest at the lowest temperatures and it

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On Non-Validity of the Kramers--Kronig Dispersion Relationships in the Case of Molecular Crystals at Various Temperatures

SOV/51-6-1-5/30

decreases with increase of temperature (about three times on increase of temperature from 20 to 290°K). The Kramers--Kronig formulae apply fully at room temperature in stilbene and tolane. On the other hand measurements on anthracene in light polarized parallel to the b-axis show that the Kramers--Kronig relationships are not obeyed even at room temperature. There are 2 figures and 10 references, 7 of which are Soviet, 2 English and 1 German.

SUBMITTED: March 29, 1958

Card 3/3

24(4), 24(6)

AUTHORS: Brodin, M.S. and Soskin, M.S.   SOV/51-6-5-7/34

TITLE: Studies of the Absorption Spectrum of 1,2-Benzanthracene Monocrystals in the Region of the Lowest Electron Transitions (Issledovaniye spektra pogloshcheniya monokristalla 1,2-benzantratsena v oblasti nizhayshikh elektronnykh perekhodov)

ABSTRACT: The authors obtained absorption spectra of 1,2-benzanthracene monocrystals (grown by sublimation) in polarized light at 20 and 290°K, in order to fill the gap in the spectral data on simple aromatic hydrocarbons (no work on the spectra of 1,2-benzanthracene was published so far). The absorption spectra were obtained for two components (a and b) in the region 25 000-33 000 cm^{-1}, which corresponds to the lowest singlet electron transitions. These spectra are shown in Figs 2 and 3, for 20 and 290°K respectively. 1 and 2 in Figs 2 and 3 denote the b-component and the a-component absorption curves respectively. The authors determined the integral intensities (areas S under the curves) of individual absorption bands and of the whole spectrum. The results of these calculations are given in Tables 1 (for 20°K) and 2 (for 290°K). The polarization ratio S_b/S_a (S_a, S_b are the corresponding areas under

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Studies of the Absorption Spectrum of 1,2-Benzanthracene Monocrystals in the Region
of the Lowest Electron Transitions

SOV/51-5-5-7/34

the a-component and b-component curves) and the "oriented gas model" were
used to deduce the direction of the electric moment (polarization) of
electron transitions in the 1,2-benzanthracene molecule. One of these
transitions (^1L_b) is directed along the y-axis of the molecule and the
other (^1L_a) makes an angle of $60°$ with that axis (Fig 1, diagram 2).
The 27 160 cm^{-1} frequency corresponds to the origin of the second
transition. The authors investigated also the optical activity of the
1,2-benzanthracene crystals. Since the monocrystals were not sufficiently
thick the results were only qualitative but optical activity was detected
and the rotation constant in the region 2460 Å was found to be
15-20 deg/mm. Acknowledgment is made to A.F. Prikhot'ko for his
advice. There are 4 figures, 2 tables and 10 references, 4 of which
are Soviet, 5 English and 1 mixed (Soviet and English).

SUBMITTED: May 12, 1953

Card 2/2

24(3), 24(4), 24(2)

AUTHORS: Brodin, M.S. and Lubchenko, A.F.

SOV/51-7-1-12/27

TITLE: The Effect of Temperature on Propagation of Electromagnetic Waves in Crystals in which Excitons are Formed (Vliyaniye temperatury na rasprostraneniye elektromagnitnykh voln v kristallakh, v kotorykh voznikayut eksitony)

PERIODICAL: Optika i spektroskopiya, 1959, Vol 7, Nr 1, pp 83-88 (USSR)

ABSTRACT: The authors discuss equations which give the refractive (n) and absorption (χ) indices for crystals in which excitons may be formed. These equations are given for weak coupling of excitons with the lattice vibrations. It is shown that with increase of temperature these equations tend to assume the form of the usual equations for n and χ in classical crystal optics. This tendency increases with the increase of the effective exciton mass and with the increase of the strength of the exciton-phonon interaction. Using Kramers--Kronig formulae the authors calculated the dispersion curves for anthracene and stilbene and compared the calculated curves with experimental ones (Figs 1, 2). It was found, in agreement with the above conclusions, that the differences between the calculated and experimental curves become

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The Effect of Temperature on Propagation of Electromagnetic Waves in Crystals in
which Excitons are Formed

SOV/51-7-1-12/27

smaller as temperature increases. At a given temperature the agreement
between experimental and theoretical curves improves on transition from
the electronic absorption bands to near electron-vibrational bands.
Acknowledgments are made to A.F. Prikhot'ko and A.S. Davydov for
their advice. There are 2 figures, 1 table and 13 references, 11 of
which are Soviet, 1 translation from German into Russian and 1 English.

SUBMITTED: July 23, 1958.

Card 2/2

24(7), 24(2)

AUTHORS: Brodin, M.S. and Prikhot'ko, A.F.   SOV/51-7-1-26/27

TITLE: The Effect of Thickness of Anthracene Crystals on their Absorption
             Curves at 20°K (Vliyaniye tolshchiny kristallov antratsena na ikh
             krivyye pogloshcheniya pri temperature 20°K)

PERIODICAL: Optika i spektroskopiya, 1959, Vol 7, Nr 1, pp 132-133 (USSR)

ABSTRACT: Plane-parallel monocrystalline layers of anthracene, prepared by
             sublimation, were used. They were deposited on quartz plates and their
             optical density was measured photoelectrically, using a photomultiplier.
             The absorption coefficients were calculated by means of the usual
             formula [Eq (1)] in which $\lg (I_0/I)$ is the measured optical density
             corrected for losses by reflection and d is the crystal thickness.
             Since the thicknesses of the crystals were comparable with wavelengths
             used, a formula which is more exact than Eq (1) should be employed
             which would allow for interference in thin films. The authors
             found, however, that due to strong absorption by anthracene the error
             due to the use of Eq (1) was small and could be neglected. At 20°K
             the authors measured $\lg (I_0/I)$ as a function of frequency of about
             20 crystals with thicknesses between 0.15 and 0.40 μ. This absorption
Card 1/2   coefficient curves of these crystals were found to depend on their

thicknesses. By way of illustration the authors show in a figure on
p 133 the absorption curves of the β-component in the region 25000-27000 cm^{-1}
for four crystals, 0.16, 0.21, 0.29 and 0.4 μ thick (curves 1, 2, 3,
4 respectively). The absorption curves obtained for the a—component
of the spectrum showed a similar dependence on thickness. These results
indicate a serious departure from the Lambert--Buger law and it is
difficult to see the reason for this behaviour. The authors point out
that this dependence on thickness was observed only at 20°K: the
absorption curves measured at room temperature were found to be
independent of thickness. The authors suggest that the reason for the
low-temperature anomalies may lie in the fact that the exciton absorption
formulae may not be valid at low temperatures. There are 1 figure and
7 references, 4 of which are Soviet and 3 English.

SUBMITTED: February 21, 1959

Card 2/2

AUTHORS: Brodin, M.S., Prikhot'ko, A.F. and Soskin, M.S.   SOV/51-7-2-25/34

TITLE: On Certain Dispersion Anomalies of Strongly Absorbing Crystals (O
             nekotorykh osobennostyakh dispersii sil'no pogloshchayushchikh
             kristallov)

PERIODICAL: Optika i spektroskopiya, 1959, Vol 7, Nr 2, pp 266-267 (USSR)

ABSTRACT: The authors showed earlier (Ref 1, 2) that certain molecular crystals,
             such as 1,2-benzanthracene and anthracene, do not obey the Kramers--Kronig
             dispersion relationships and that the degree of the departure from these
             relationships increases with lowering of temperature. The authors used
             a Jamin interferometer to obtain the dispersion curves throughout the
             region of the first electron-vibrational transition, with the exception
             of the wavelengths where maximum absorption occurred in strong bands,
             i.e. wavelengths at which anomalous dispersion took place. The present
             paper describes studies of these anomalous dispersion regions in thin
             crystals of 1,2-benzanthracene and anthracene. An arrow in Fig 1 shows
             the maximum of the first long-wavelength absorption band in the
             6-component of the spectrum of 1,2-benzanthracene (0.25 μ thick) at
Card 1/2   20°K. It is seen that the interference bands in the region of the arrow
             are apparently split into two and overlap, which is not predicted by the

On Certain Dispersion Anomalies of Strongly Absorbing Crystals   SOV/51-7-2-25/34

usual theory of anomalous dispersion. It is suggested that the observed
effect is due to propagation of two identically polarized waves with
unequal bath differences. This dispersion peculiarity was not observed
in 1,2-benzanthracene at room temperature (Fig 2). In the case of
anthracene the splitting and overlapping of interference bands at the
absorption maxima was observed both at low and at room temperatures. The
two waves, which are not due to the usual birefringence, were recently
predicted (Refs 5, 6) for the region of exciton absorption in crystals.
The authors suggest that this may in fact explain the observed anomalies.
If this interpretation is correct such anomalies should not be observed
in impurity crystals. The latter conclusion is confirmed by a photograph
of the interference system in the absorption region of anthracene molecules
present in a crystal of dihydroanthracene (Fig 3); no anomalies are seen
in that photograph. The authors point out that the observed anomalies occur
only in the case when the Kramers--Kronig relationships are not obeyed.
There are 3 figures and 6 references, 5 of which are Soviet and 1 English.

SUBMITTED: February 21, 1959

Card 2/2

84076
S/181/60/002/009/017/036
B004/B056

26.1512

AUTHOR: Brodin, M. S.

TITLE: The Optical Properties of CdS Single Crystals

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 9, pp. 2152 - 2157

TEXT: It was the aim of the present paper to extend the measurement of
the refractive index μ and the reflection coefficient R of CdS single
crystals to the range of short wavelengths at 290 and $20^\circ K$, to investi-
gate the anisotropy of the dispersion curves, and to check the Kramers –
Kronig correlation. Single crystals having a thickness of from 5 to 1.5 μ
and grown in the gaseous phase were used. The λ-dependence of the re-
fractive indices was recorded by an interferometer according to a method
described previously (Ref. 10). The intensity of the reflected light
was measured by means of an apparatus described in Fig. 1 and compared
with a standard made from quartz or aluminum mirror. A photomultiplier
of the type ФЭУ-18 (FEU-18) was used as a receiver of the light energy.
The values of the refractive indices were fairly stable in the case of
various crystals within the region of transmissivity to visible light,

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The Optical Properties of CdS Single Crystals   S/181/60/002/009/017/036
                                                  B004/B056

and the curves adapted themselves well to one another. Figs. 2,3 show
the λ-dependence of the dispersion of a 2 μ thick crystal at the tempera-
tures mentioned, which was measured in polarized light, and two polariza-
tion directions $\perp$C and $\parallel$C, which are perpendicular to each other. The
curve corresponding to the light vector $\perp$C breaks off sooner in the vio-
let region than the curve for $\parallel$C. The two curves intersect before reach-
ing the absorption band. For 290°K the point of intersection is at
λ = 5080 A, for 20°K at 4880 A. At this point, the crystal is not bi-
refringent, and behind it, birefringence changes its sign. Checking of
the Kramers - Kronig correlation succeeded for the $\parallel$C spectral component
in the case of which the intensive absorption band was exceeded and the
total dispersion amplitude within the band could be determined. Within
the spectral band investigated (4750 - 5000 A) the experimental data
were found to be in agreement with the Kramers - Kronig formula. In this
way, the assumption of an exciton character of the absorption beginning
at 5000 A is refuted. Recording of the reflection curve R(λ) (Fig. 4)
showed differences by far exceeding the experimental errors in various
samples, which is attributed to the unstable properties of the crystal
surface due to oxidation or excess of one of the two components of the

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The Optical Properties of CdS Single Crystals   S/181/60/002/009/017/036
                                                  B004/B056

compound. The dichroism of the reflection repeats the course of the
dispersion curve. The curves for ||C and ⊥C intersect. The position of
the point of intersection, however, changes in the individual samples.
The author thanks A. F. Prikhot'ko for discussions. There are 4 figures
and 14 references: 6 Soviet, 6 US, 1 Japanese, and 1 German.

ASSOCIATION: Institut fiziki AN USSR, Kiyev (Institute of Physics of
              the AS UkrSSR, Kiyev)

SUBMITTED: July 8, 1959

Card 3/3

BRODIN, M.S.; PRIKHOT'KO, A.F. [Prykhot'ko, A.F.]; SOSKIN, M.S.

Optical properties of crystals. Part 1. Ukr. fiz. zhur. 5 no.6:725-
743 N-D '60.   (MIRA 14:3)

1. Institut fiziki AN USSR.
            (Crystals—Optical properties)

BRODIN, M.S.; PEKAR, S.I.

Experimental proof of the existence of anomalous additional light
waves in crystals in the exciton absorption region. Zhur. eksp. i
teor. fiz. 38 no.1:74-81 Jan '60.   (MIRA 14:9)

1. Institut fiziki Akademii nauk Ukrainskoy SSR.
     (Anthracene crystals) (Excitons) (Light)

85701

S/056/60/038/006/044/049/XX
B006/B070

24.3500 (1035, 1114, 1138)

AUTHORS: Brodin, M. S., Pekar, S. I.

TITLE: Additional Anomalous Light Waves in Anthracene in the Region
              of Exciton Absorption

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,
              Vol. 38, No. 6, pp. 1910 - 1912

TEXT: The existence of additional anomalous light waves in crystals in
the region of exciton absorption was theoretically predicted by Pekar
(Refs. 1-3). An experimental proof of this assumption was suggested by
the present authors in Ref.4. In the same paper also data of previous
measurements of light absorption in anthracene plates of different thick-
ness had been evaluated (in the region of characteristic absorption,

maximum at $25,200 \text{ cm}^{-1}$). It was found that the intensity of transmitted
light as a function of the plate thickness was subject to fluctuations.
In the present "Letter to the Editor", a report is made on the absolute
measurement of the intensity of light by the method of photographic

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85701

Additional Anomalous Light Waves in·   S/056/60/038/006/044/049/XX
Anthracene in the Region of Exciton   B006/B070
Absorption

photometry (reference line: 24,720 cm^{-1}). A spectrograph of the type
ДФС-3 (DFS-3) was used for 3) different thicknesses of the crystal. The
measured optical density of the crystal as a function of its thickness
for the frequency 25,108 cm^{-1} is shown in a diagram (T = 20°K). The os-
cillation character is here clearer than in the curves of Ref.4. It is
noted that the separations Δl of the extrema are about equal (abscissas
of the maxima: l = ~0.072, 0.128, 0.188, 0.245 μ; separations: Δl ~0.056,
0.060, 0.057 μ; minima: l = 0.105, 0.168, 0.233 μ; separations:
Δl = 0.063 and 0.055 μ). With this, the average period of oscillation is
found to be 0.058 μ, and the corresponding difference in the refractive
indices of two interfering waves to be 6.9. The character of the curve
shown in the Fig. is that of a theoretical curve describing the inter-
ference between two parallel anomalous waves polarized in parallel. These
more accurate measurements again demonstrate the existence of additional
anomalous waves in the crystal of anthracene, as is required by the
theory. A. F. Prikhot'ko is thanked for interest and discussions, and
S. V. Marisova for help in experiments. I. V. Obreimov is mentioned.

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85701

Additional Anomalous Light Waves in
Anthracene in the Region of Exciton
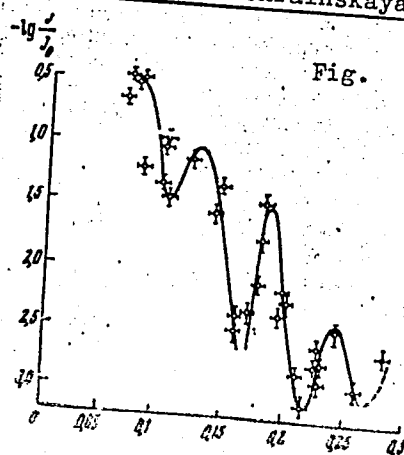Absorption

S/056/60/038/006/044/049/XX
B006/B070

There are 1 figure and 6 Soviet references.

ASSOCIATION: Institut Fiziki Akademii nauk Ukrainskoy SSR (Institute of
Physics of the Academy of Sciences Ukrainskaya SSR)

SUBMITTED: March 19, 1959

Fig.

Fig.

Card 3/3

AUTHORS: Brodin, M.S., and Krochuk, A.S.

TITLE: Fine structure and temperature dependence of CuCl
             single crystals absorption-spectrum

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 6, no. 5, 1961,
             706 – 709

TEXT: Plane-parallel single-crystals, 5 – 40 μ thick, were prepa-
red; no thinner plate could be obtained by mechanical means. The
absorption spectra were obtained at temperatures of 4.2, 20.4, 150
and 290°K on a spectrograph with a dispersion of 4 Å/mm; the re-
flection spectra were photographed at 20.4°K with a dispersion of
10 Å/mm. A figure shows the curves of the absorption edge for a
specimen 23 μ thick, at the four indicated values of the temperatu-
re. Two strong absorption-bands were observed, one at T = 4.2°K,
$\nu \approx 25834$ cm^{-1}, and the other at T = 20.4°K with a reflection maxi-
mum at $\nu = 26435$ cm^{-1}. These bands are apparently exciton bands.
They were also observed in polycrystalline films by R. Reiss and

Card 1/3

Fine structure and temperature ...

S/185/61/006/005/016/019
D274/D303

S. Nikitine (Ref. 3: C.r. Acad. Sci., 250, 2862, 1960), where the presence of weak bands between the above two bands, was observed. The authors were however unable to observe these weak bands. On the other hand, the authors observed two weak and very narrow bands on the longwave side of the band $\nu = 25834$ cm^{-1}. They are best observed at liquid helium temperature, and are broadened on increase of temperature. These bands have two interesting properties: their relative intensity varies from crystal to crystal, so that in one specimen the first band is stronger and in another specimen – the second; in addition, their intensity depends little on thickness of specimen. Another characteristic feature of the absorption bands of CuCl, is the non-monotonic temperature shift of the absorption edge; the authors concluded that the maximum of the strong absorption band $\nu = 25834$ cm^{-1} at $T = 4.2^\circ$K, is also non-monotonically temperature dependent. The narrow bands, 25642 and 25694 cm^{-1} have a similar temperature shift. The non-monotonic character of the temperature shift is an indication of the complex absorption mechanism and deserves further study. Further, the peculiar features of the narrow bands are related to the inhomogeneity of impurity centers,

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Fine structure and temperature ...   S/185/61/006/005/016/019
D274/D303

whole field influence the corresponding exciton levels. As the au-
thors did not conduct crystallographic investigations, they were
unable to ascertain the relationship between the anisotropic cha-
racter of the ████tals and the peculiarities of the narrow bands.
There are 2 figures and 6 references: 3 Soviet-bloc and 3 non-So-
viet-bloc. The reference to the English-language publication reads
as follows: R. Coelho, Techn. Rep. 143, Mass (USA), October 1960.

ASSOCIATION: Instytut fizyky AN URSR m. Kyyiv (Institute of Phy-
             sics AS UkrSSR, Kyyiv)

SUBMITTED: June 10, 1961

Card 3/3

BRODIN, M.S.; MARISOVA, S.V.

Davydov splitting and polarization ratio in the region of the
first electron transition of an anthracene crystal. Opt. i
spektr. 10 no.4:473-476 Ap '61.   (MIRA 14:3)
                    (Anthracene crystals—Spectra)

28104
S/181/61/003/009/038/039
B108/B138

AUTHORS: Brodin, M. S., Vitrikhovskiy, N. I., Strashnikova, M. I.

TITLE: Structure of the spectra of $CdS_x.CdSe_{1-x}$ and $CdS_x.ZnS_{1-x}$
             hybrid crystals at $20°K$

PERIODICAL: Fizika tverdogo tela, v. 3, no. 9, 1961, 2882-2885

TEXT: Ye. F. Gross and V. V. Sobolev (DAN SSSR, 133, 56, 1960) have shown
that the emission spectrum of CdS-CdSe solid solutions at low temperatures
bears the same character as the CdS spectrum. V. V. Yeremenko (FTT, II,
2602, 1960) studied the low-temperature absorption spectra of $CdS_x.CdSe_{1-x}$
hybrids but could not find any fine structure, apparently because he did
not have sufficiently thin specimens at his disposal. In order to
elucidate this problem, and to obtain data on the character of the
excitation in pure crystals the authors studied 10 - 20μ thick hexagonal
CdS-CdSe and CdS-ZnS hybrids. The back-reflection spectra were taken by
means of a Hilger-E2 spectrograph. Photomicrographs of such spectra

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28104

S/181/61/003/009/038/039

Structure of the spectra of CdS_x ...   B108/B138

taken at a temperature of $20°K$ from CdS, $CdS_{0.95} \cdot CdSe_{0.05}$, and $CdS_{0.94} ZnS_{0.06}$ single crystals are shown in the Figure (a, b, and c, respectively). It was found that the absorption spectrum of any CdSe.CdS hybrid has a fine structure. The bands 1 and 2 in the figure are shifted to the longwave side by about 60 cm^{-1} when the CdSe concentration in CdS rises by one percent by weight, whereas the band 3 is shifted only by about 30 cm^{-1}. The back reflection in polarized light indicates that the absorption of $CdS_x \cdot CdSe_{1-x}$ has a distinct dichroism: The $\perp C$ absorption edge is shifted to longer waves. The $CdS_x \cdot CdSe_{1-x}$ hybrids exhibit an inversion point of the refractive index at which the crystal foils are not birefringent. The back-reflection and, consequently, the absorption spectra of $CdS_x \cdot ZnS_{1-x}$ hybrids are very similar to those of pure CdS, particularly when the ZnS concentration is low. When the ZnS concentration is higher than about 20%, the back reflection bands become more and more blurred. This phenomenon is explained by the interference bands arising when the rays are reflected in the transparent region from both the front and the back surface of the

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28104   S/181/61/003/009/038/039
Structure of the spectra of CdS_x ...   B108/B138

crystal foil. The argument that the crystal is inhomogeneous is not
justified since then interference bands could never exist. The difference
in the band shift with concentration is explained as follows: The optical
electrons of CdS responsible for the bands 1 and 2 in the valence band
are preferably connected with the Cd ion, the electron causing the band
no. 3, however, with the S ion. There are 1 figure and 8 references:
5 Soviet and 3 non-Soviet. The two references to English-language
publications read as follows: S. Y. Czyzak et al., J. Opt. Soc., 47,
240, 1957. D. G. Thomas, Y. Y. Hopfield. Phys. Rev., 116, 573, 1959.

ASSOCIATION: Institute fiziki AN USSR (Physics Institute of the AS
              UkrSSR) Institut poluprovodnikov AN USSR Kiyev (Semiconductor
              Institute of the AS UkrSSR Kiyev)

SUBMITTED: May 22, 1961

Card 3/4

BRODIN, M.S.; KROCHUK, A.S.

Fine structure and temperature dependence of the edge of the absorption spectrum of CuCl monocrystals. Ukr. fiz. zhur. 6 no.5:706-709 S-0 '61. (MIRA 14:11)

1. Institut fiziki AN USSR, g. Kiyev.
                (Copperchloride crystals--Spectra)

BABENKO, V.P.; BRODIN, M.S.; SOSKIN, M.S.

Cryostat for dispersion measurements at low temperatures.
Prib. i tekh.eksp. 6 no.6:140-141 N-D '61.   (MIRA 14:11)

1. Institut fiziki AN USSR.
                (Cryostat)

BRODIN, M.S.; MARISOVA, S.V.

Spectral distribution of the dependence of the transparency of
anthracene single crystals on their thickness. Ukr.fiz.zhur.
6 no.6:745-750 N-D '61.   (MIRA 16:5)

1. Institut fiziki AN UkrSSR, Kiyev.
        (Anthracene crystals—Optical properties)

S/051/61/011/006/005/012
E039/E385

AUTHORS: Brodin, M.S. and Dovgiy, Ya.O.

TITLE: Optical properties of mixed crystals. I.
Characteristic absorption in dispersive mixtures of
anthracene in crystals of 9,10-dihydroanthracene

PERIODICAL: Optika i spektroskopiya, v.11, no.6, 1961, 742-749

TEXT: The authors studied the optical properties of mixed
crystals and the dependence of these properties on the concen-
tration of the mixture. Absorption curves were obtained for
dispersive mixtures of anthracene in crystals of
9,10-dihydroanthracene. The samples were grown by a sublimation
method, producing monocrystalline plane parallel plates of various
thickness, suitable for quantitative optical measurement. The
absorption measurements were obtained with a photographic
recording large dispersion spectrograph (4 $\mathring{A}$/mm). When calculating
the absorption coefficients corrections were made for the spectral
intensity distribution of the source, the spectral sensitivity
of the plate and, for important measurements, the reflection of
light from the crystal faces. The polarization measurements were
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Optical properties of S/051/61/011/006/005/012
E039/E385

made using Nicol prisms and the dispersion curves were measured
by an interferometric method. The absorption curves were
measured in the region of the first electron transition of
anthracene for a series of samples containing an admixture of
various concentrations in the range 0.2 - 5%. Measurements were
carried out at several temperatures (290, 145, 77 and 20 $^{\circ}$K) but
the principal investigation was at 20 $^{\circ}$K. A typical absorption
curve for 0.6% anthracene in 9,10-dihydroanthracene at 20 $^{\circ}$K, show-
ing also the effect of polarized light, is given in Fig. 1a, where
o - light polarized parallel to b axis, $\triangle$ - light polarized
parallel to a axis, к - absorption coefficient and
$\vee$ - frequency. The experimental data on dispersion were compared
with the Kramer-Kronig relationship. There is a small disagreement
at low concentrations which, according to the measurements, grows
with increasing concentration of the mixture. If it is assumed
that the anthracene molecules are uniformly distributed, the
distances between them would be approximately 20 Å but the
investigation described here shows that the spacings between the
anthracene molecules are unequal. Acknowledgments are expressed

Card 2/3

Optical properties of ....

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to A.F. Prikhot'ko for his interest in the present work.
There are 2 figures, 2 tables and 8 references: 6 Soviet-bloc
and 2 non-Soviet-bloc. The English-language references
mentioned are: Ref. 3: D.S. McClure, J. Chem.Phys., 22, 1668,
1954; 24, 1, 1956; Y.W. Sidman, Phys. Rev., 102, 96, 1956;
Y.W. Sidman, J. Chem. O..ys., 25, 115, 1956; Y.W. Sidman,
D.S. McClure - J. Chem. Phys., 24, 757, 1956;
Ref. 5: Y. Iball - J. Chem. Soc., 1074, 1938.

SUBMITTED: January 2, 1961

Card 3/4
3

40884

S/181/62/004/009/018/045
B108/B186

AUTHORS: Brodin, M. S., and Strashnikova, M. I.

TITLE: Singularities in the dispersion and shape of the exciton
             absorption bands of CdS single crystals

PERIODICAL: Fizika tverdogo tela, v. 4, no. 9, 1962, 2454 - 2460

TEXT: A homogeneous layer (0.095 μ) of CdS was studied. The absorption
curves were measured at 77, 20, and 4°K with a grating spectrograph. The
dispersion curves were determined by a method described earlier (PTE, no. 3,
96, 1956; no. 6, 140, 1961). Two principal absorption bands were found
(Fig. 1) with linearly polarized light ($E \perp C$ and $E \parallel C$; C is the hexagonal
crystal axis). With $E \perp C$, the band A has a greater dispersion than the
band B although its peak height and integral intensity are nearly the same
as those of B (Fig. 3). This makes the Kramers-Kronig dispersion relation
no longer applicable in this section of the spectrum. It is concluded that
the exciton whose excitation leads to the band B enters into no strong
interaction with the phonons. There are 4 figures and 2 tables.

ASSOCIATION: Institut fiziki AN USSR, Kiyev (Physics Institute AS UkrSSR,
             Kiyev)

Submitted   April 1962

S/185/62/007/001/004/01⁄
D299/D302

AUTHORS: Brodin, M.S., and Dovhyy, Ya.O.

TITLE: On some peculiar features of the exciton-absorption
             spectrum of sodium-uranylacetate single-crystals

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 7, no. 1, 1962,
             30 - 36

TEXT: The spectra were analyzed in circularly-polarized light. The
structure of the absorption bands and their intensity were determined. The dependence of the absorption on specimen thickness was studied. The investigations were carried out at low temperatures (20 and $4^\circ K$ respectively). Absorption spectra of both dextro- and levo-rotatory single-crystals were obtained. At $20^\circ K$, nine narrow absorption bands were observed. At $4^\circ K$, each of these absorption bands separates into 2 - 3 components. The 9 absorption bands are characterized by a high degree of circular dichroism. These bands were not observed in the spectrum of a chilled solution (at $77^\circ K$) of sodium-uranylacetate. This fact in conjunction with the high degree of cir-

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On some peculiar features of the ...   S/185/62/007/001/004/014
D299/D302

cular dichroism of the absorption bands, shows that the observed
bands are of exciton type. A figure shows the absorption curves

$$\kappa(\nu) = \lg \frac{J_0}{J}/4\pi d\nu \cdot 0.43,$$ at 20°K, for a dextrorotatory crystal, 0.529

mm thick. These curves are a measure of the intensity distribution
in some of more characteristic narrow bands, as well as of the de-
gree of circular dichroism. The absorption curves for the levorota-   ✓
tory crystals are almost identical with those for the dextrorotatory   —
ones. Further, the dependence of the intensity of the absorption
band (with frequency ν_m = 21135 cm^{-1}), on specimen thickness, was in-
vestigated; the thickness varied between 170 – 650 µ. For 3 special
points (21133, 21134.2, 21137 cm^{-1}), a non-monotonic dependence of
the optical density on thickness was observed. The shape and the po-
sition of the maximum of the band vary with specimen thickness. The-
se facts might be related to the presence of anomalous light waves
in the absorption band under consideration or to quadrupole origin
of the band; it is also possible that both factors are responsible.
A final explanation would require further optical and crystallogra-
Card 2/3

On some peculiar features of the ...   S/185/62/007/001/004/014
                                            D299/D302

phic investigations. There are 5 figures and 8 references: 7 Soviet-bloc and 1 non-Soviet-bloc.

ASSOCIATION: Instytut fizyky AN URSR (Institute of Physics of the AS UkrRSR), Kyyiv

SUBMITTED: March 6, 1961

Card 3/3

38849

S/185/62/007/006/014/014
D407/D301

14 3950

AUTHORS: Brodin, M. S. and Strashnikova, M. I.

TITLE: Absorption and dispersion of light in CdS single-cry-
              stals at 20°K

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 7, no. 6, 1962,
              681-683

TEXT: The absorption and dispersion curves of thin CdS single-
crystals in the special region 20 500 - 21 500 cm^{-1} were measured.
This region contains two intensive absorption bands. The present
investigation constitutes a continuation based on more adequate
data, of an earlier study by M. S. Brodin (Ref. 9: FTT, 2, 2152,
1960), which had the purpose of verifying the Kramers-Kronig dis-
persion relations. CdS single-crystals (0.1 μ thick) were fixed on
quartz plates. The measurements were conducted at 20°K in polarized
light. A spectrograph with a dispersion of 4 Å/mm was used. The
light intensity was measured by the method of photographic photo-
-metering. The dispersion curves were obtained by the interference

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Absorption and dispersion ...   S/185/62/007/006/014/014
                                D407/D301

method. The position of the maximum of one of the bands is noted as
a peculiar feature of the spectrum. The two intensive bands are
denoted by A and B. By comparing the spectra a and b (correspond-
ing to two different angles of light polarization) it was found
that on turning the crystal the maximum of the band A is shifted
towards the long-wavelength side; a similar shift was observed if
the crystal rotated about its vertical axis. No corresponding shift
of the band B was observed; The shift of the band A cannot be ex-
plained by variations in reflection, neither by crystal inhomoge-
neities nor by its rotation. A satisfactory interpretation of the
observed shift requires further experimental work. It is noted,
however, that energy changes of the exciton transition as a func-
tion of the direction of polarization and of the wave vector were
predicted by theory. From a figure it is evident that the band A
($\nu_m = 20\ 567\ cm^{-1}$) is completely polarized in a direction normal to
the C-axis. At $T = 20^{\circ}K$, it has no fine structure. The maximum of
the band B is slightly shifted as a result of the polarization. The
bands A and B have practically equal intensity. The dispersion

Card 2/3

Absorption and dispersion ...   S/185/62/007/006/014/014
D407/D301

curves, just as the absorption curves, were obtained at two differ-
ent polarization angles and also at normal incidence. A maximum of
the dispersion curve was observed in the region of the first band,
followed by an anomalous section and a sharp drop. The authors
were unable to sufficiently reduce the amplitude of the dispersion
curves. In the region of the band B it was possible to construct
the entire dispersion curve. The character of the dispersion cur-
ves for the ordinary and extraordinary waves is an indication of
the complexity of the double refraction of the crystal in the ab-
sorption region; the crystal has inversion points of the refrac-
tion index in the entire spectral range. On comparing the absorp-
tion and dispersion curves, it is noted that although the bands
A and B are similar in many respects, yet they are related to quite
dissimilar amplitudes of the dispersion curves. Ther Kramers-Kronig
relations are not completely corroborated by the above experimental
results. There are 3 figures.

ASSOCIATION: Instytut fizyky AN UkrRSR, Kyyiv (Institute of Phy-
              sics of the AS UkrRSR, Kiyev)
SUBMITTED: March 2, 1962
Card 3/3

S/051/62/012/002/017/020
E202/E192

AUTHORS: Brodin, M.S., and Dovgiy, Ya.O.

TITLE: Experimental study of circular dichroism and optical
             activity of sodium uranyl acetate single crystals

PERIODICAL: Optika i spektroskopiya, v.12, no.2, 1962, 285-290

TEXT: This paper opens an extensive study of the above
single crystals, which due to their optical activity are likely to
display the effects of space dispersion.. The absorption curves of
crystal origin bands were measured in detail to determine their
polarisation and intensity. The luminescence spectrum was also
taken and briefly commented on. Rectangular prism shaped, highly
polished crystals of 0.2-1 mm thickness were grown from pure
solution. l- and d-rotatory specimens were studied. Circle
polarised light was used and the sample was kept in a cryostat
within 77-20 °K. Absorption curves were measured photographically
using high dispersion spectrograph (2 and 4 Å/mm), and a three-
lens illuminator for the slit. Spectra were photographed through
a stepwise intensity wedge, analysed with a microphotometer and
the values used to determine the coefficient of absorption.
Card 1/2

Experimental study of circular ...   S/051/62/012/002/017/020
E202/E192

To determine the amount and spectral distribution of the optical activity, transmission spectra of crystals placed between crossed polarisers were taken. It was found that the absorption spectrum of a single crystal, as well as a frozen solution consisted of strong, periodically reappearing groups of bands, which were attributed to the excitation of molecular electrons. In addition, the single crystal spectrum had seven characteristically spaced narrow bands with considerable circular dichroism. These were present chefly only in a spectrum of one direction of circular polarisation, while the opposite direction of polarisation led to very weak intensities. The distribution of optical activity showed that the crystal rotates the plane of polarisation only in the vicinity of bands with a pronounced circular dichroism.
There are 3 figures.

SUBMITTED: January 21, 1961

Card 2/2

BRODIN, M.S.

Study of the form of absorption bands in tolan single crystals
Ukr.fiz.zhur. 7 no.4:417-421 Ap '62.   (MIRA 15:8)

1. Institut fiziki AN UkrSSR, g. Kiyev.
        (Acetylene)   (Absorption spectra)

45077

24,3950

S/051/63/014/001/014/031
E039/E120

AUTHORS: Brodin, M.S., and Krochuk, A.S.

TITLE: Peculiarities of the optical absorption of CuCl single crystals

PERIODICAL: Optika i spektroskopiya, v.14, no.1, 1963, 88-93

TEXT: Samples of CuCl, which belongs to the cubic system and has T_d^2 symmetry, were prepared in the form of thin parallel plates (10 μ or more thickness) from large single crystals grown at the Institut Kristallografii AN SSSR (Institute of Crystallography, AS USSR). These crystals were uniform and colourless with a mirror finish on their surfaces. They were mounted either in paper holders or on quartz plates; the method of fixing did not influence their spectra. Photographic recording was used on a diffraction grating spectrograph with a dispersion of 4 Å/mm. A Xenon lamp was used as a light source; this provided a continuous spectrum in the region investigated. Absorption curves were obtained at temperatures of 290, 150, 77, 20.4 and 4.2 °K. Reflection spectra were obtained using normal incidence at 290, 150, 77 and 20.4 °K. In the latter case wedge-

Card 1/2

1

Peculiarities of the optical ...   S/051/63/014/001/014/031
                                        E039/E120

shaped samples were used to avoid light reflected from the back
surface entering the spectrograph. At low temperatures strong
bands were observed which are ascribed to exciton excitation.
The temperature displacement of the edge of the spectrum is not .
monotonic, hence confirming the complex character of absorption.
Near the intensity maximum 25 830 cm^{-1} at 4.2 °K three narrow
weak bands were observed at 25 642, 25 694 and 25 706 cm^{-1}
which can be grouped in a hydrogen-like series, described by the
relation

$$\nu_n = 25\ 710 - \frac{68}{n^2}\ cm^{-1}$$

where n = 1, 2 and 3.
There are 4 figures.

SUBMITTED: December 20, 1961
Card 2/2